Surveys of Consumer Attitudes

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REVERSE ANNUITY MORTAGES--
A POTENTIAL DISSAVING
MECHANISM FOR ELDERLY HOMEOWNERS

by

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During the past decade of inflation, homeowners have seen the value of their homes skyrocket while their pocketbooks are pinched by the higher prices of necessities. Many elderly homeowners are house value rich, but income poor, without a satisfactory means of dissaving the equity in their homes. A proposed financial instrument, a reverse annuity mortgage, could ease the liquidity problem of elderly homeowners and could offer them more choices in housing decisions.

This report seeks to demonstrate the potential of reverse annuity mortgages in supplementing the elderly's income. The details of the basic reverse annuity mortgage are described, along with a comparison of existing dissaving alternatives. Payment amounts and the degree of income support are estimated from a national sample of families. Finally, problems involved in the implementation of this private income support program are discussed.

A conventional loan consists of an individual borrowing a lump sum of money from a financial institution and gradually repaying (amortizing) the loan in the future. The financial institution makes the loan based on the individual's expected future income.

A reverse annuity mortgage (RAM) consists of a homeowner borrowing from a financial institution based on the current value of the individual's house. The homeowner receives a stream of future payments (an annuity) in return for promising

to repay the loan out of the individual's estate. The homeowner keeps full possession and use of the house during the life tenure.

Basically, with a reverse annuity mortgage, homeowners receive cash payments for the rest of their lives after borrowing against the equity in their homes. The homeowners remain in their homes for life or until they decide to sell the homes, at which time the loans are repaid.

A Reverse annuity mortgage can take an infinite number of forms (Guttentag, 1977; Edwards, 1977) depending on the needs of the borrower. A RAM is a loan on which the principal is not paid back during the life of the loan (non-amortizing) which is paid out in regular installments to the homeowners. The basic form is called a fixed debt non-repayable loan (NRPL). The interest charges are subtracted from the payments so the value of the loan is fixed.

Non-repayable loans are not currently offered due to a federal prohibition of long-term non-amortized loans. Saving and loan companies are prohibited from offering loans exceeding five years in maturity, which do not require that the principal be paid off during the life of the loan. This restricts the type of RAM discussed in this paper, since the average life expectancy of anyone younger than 90 is longer than five years. Legislation is currently pending to remove the restriction on non-repayable loans.

RAMs Versus the Present Alternatives

Homeowners have few alternatives that could cash out the value of their house short of selling their home. Homeownership is important for more than just sentimental reasons. Homeowners have available rent-free housing services and are, thus, protected from outliving their capital. Homeowners possess a real, rather than a financial, asset and are, therefore, to some degree protected from inflation. While renters faced increasing rents during past inflations, homeowners have seen the values of their homes keep pace or exceed the rise in consumer prices (Curtin and Neubig, 1979).

The most common means of dissaving the equity in the home is to let the house depreciate through lack of maintenance. Many elderly homeowners who are strapped for cash but who are reluctant to sell their homes cut back on the necessary upkeep and repairs to their homes. Deterioration of a home is a destructive means of dissaving because not only is the value of the home reduced but the quality of the housing services provided to the homeowner is also reduced.

Sale-and-lease of the house would not involve the homeowner leaving the house, but the homeowner would lose any future capital gains on the house. An elderly person who did not capture any future price appreciation of the house would be losing a major protection against inflation. The elderly person would also face the chance of outliving the value of their remaining assets.

Conventional loans for an elderly homeowner are not a good means of reducing the equity in a house. The principal of a conventional loan is paid back during the life of the loan. A conventional loan would temporarily increase the homeowner's funds, but the homeowner would have to continue refinancing the loan in order to repay the principal. At some point in the future the value of the loan could equal the value of the house at which time the homeowner would have to sell the home in order to repay the loan. The homeowner would then have no home nor assets remaining.

Table 1 compares a reverse annuity mortgage with the alternative choices open to homeowners wishing to cash out some of their equity in a home. The non-repayable loan RAM has desirable features relative to the available alternatives.

--The homeowner retains ownership and use of the home.

--Reverse annuity mortgages can be designed to let homeowners choose the rate of dissaving of the equity. The homeowner can select the desired stream of income from the equity that would leave a chosen estate.

--The homeowner can live in the home for life and continue receiving rent-free services. The homeowners would not have to be afraid of outliving their assets when they are guaranteed life tenure in their homes.

--During the life tenure, the homeowners would capture any price appreciation of the home. The homeowner

TABLE 1

CHOICES AVAILABLE TO ELDERLY HOMEOWNERS WISHING TO CASH OUT THEIR HOUSE'S EQUITY

Choices	Cash out the net equity	Life tenure in the house	Capture the price appreciation	Protection from out-living one's capital	Option for heirs keeping the family home
Living in the home and leaving a large estate	No	Yes	Yes	Yes	Yes
Selling the home and moving to a smaller house	Partially	No	Yes	Yes	No
Moving to a rental residence	Yes	No	No	No	No
Sale-and-lease	Yes	No	No	No	No
Conventional loan	No	Maybe	Yes	No	Maybe
Reverse annuity mortgage	Yes	Yes	Yes	Yes	Yes

could choose to dissave all, some, or none of the additional equity from the price appreciation.

--The heirs of the homeowner would have the option of keeping the home. The heirs could repay the loan instead of having the home sold by the estate.

--Reverse annuity mortgages, thus, widen the alternatives available to elderly homeowners wishing to cash out the equity in their homes. At the same time, RAMs provide protection against inflation and the mortality risk of outliving one's assets.

The non-repayable loan would be a private transaction between a homeowner and a financial institution. An arms-length arrangement would be made based on the current market value of the home and current market interest rates. It would involve no forecasting of the expected price appreciation of individual homes. The mortality risks involved would be shared through the usual channel of annuities.

A non-repayable loan would involve only one process as far as the homeowner is concerned. The homeowner would receive monthly annuity payments from the financial institution. In order to understand the calculation of the payment amount, the fixed debt NRPL can be thought of as a three step process. First, the homeowner contracts with a financial institution to

borrow a stream of payments using the home as collateral. The financial institution credits the homeowner with the funds from the loan, and 2) purchases a whole-life annuity with the funds. The annuity payment is based on the age, marital status, and sex of the homeowner. 3) When the annuity payment is made the homeowner receives cash for living expenses and the financial institution keeps part for the interest charge. The full annuity payment is called the gross annuity. The annuity payment net of the interest charge is called the net annuity.

The table below shows the equations for the gross and net annuity payments and the parameters involved. The annuity payments are larger the shorter the life expectancy of the homeowner. A fewer number of years over which the annuity is paid increases the fraction of the equity in the home which can be paid each year. The larger the equity in the home the larger the annuity payments.

Financial institutions are hesitant to lend the full market value of a house, even with the recent high rates of price appreciation of homes, so a loan to equity ration would be established. A reasonable ratio of 0.80 would leave the homeowner with some equity, which would preserve the responsibilities of ownership and safeguard the financial institution's investment. The higher the ratio of loan to house value the greater the annuity payment.

TABLE 2

THE NON-REPAYABLE LOAN AND ITS PARAMETERS

Gross Annuity Payment	$A_g = \alpha V \left(\frac{r_a}{1 - e^{-r_a n}}\right)$
Net Annuity Payment (Fixed debt NRPL)	$A_n = \alpha V \left(\frac{r_a}{1 - e^{-r_a n}}\right) - \alpha V r_l = A_g - V r_l$
if $r_a = r_l = r$	$A_n = \alpha V r \left(\frac{1}{e^{rn} - 1}\right)$

Parameters:

- n = life expectancy (number of payments)
- r_a = interest rate on the annuity
- r_l = interest rate on the borrowed funds
- V = present value of the house equity
- α = ratio of loan borrowed to equity ($0<\alpha<1$)
- e = Euler's constant (≈ 2.718) for continuous compounding

If an annuity is purchased from an insurance company, the investment in the annuity accrues interest over the life of the annuitant. The higher the annuity interest rate, r_a, the larger the payment.

The second interest rate is the financial institution's opportunity cost of lending money to the homeowner. The higher the interest rate charged by the lender, r_l, the smaller the net annuity. An increase in the lender's interest rate raises the interest charge and reduces the payment received by the homeowner.

If an individual homeowner borrowed money from a bank and purchased an annuity, the individual would face an interest rate differential, $r_l - r_a > 0$, which would significantly reduce the net annuity payment. A differential exists between the interest rate at which individuals can borrow and the interest rate at which individuals can invest (i.e., purchase annuities). The differential occurs because two profit margins and two administrative costs are involved. The cost of service and the risk of default are much higher for an individual than for a large borrower such as another financial institution.

A reverse annuity mortgage, if properly designed, would have a single interest rate. If one financial institution handled the RAM, the financial institution would be lending money to the homeowner while investing the money to earn interest on the annuity. Thus, no reason exists for an interest differential on a RAM handled by a single institution.

The higher the single interest rate, r, the smaller the annuity payment. This occurs because the interest charge by the lender is on the full amount borrowed throughout the homeowner's life, while the amount of money earning interest on the annuity is gradually reduced by the annuity payments.

Reverse annuity mortgages can be judged on the basis of the interest rate like a conventional loan. The higher the interest rate the larger the interest charges which reduce the net annuity payment. RAMs that involve an interest rate differential significantly reduce the net annuity payment to the disadvantage of the homeowner.

RAM Payment Amounts

The RAM payments are not as large as a person expects initially. The life expectancy of a 65 year old single female is almost twenty years. Elderly females' life expectanies are approximately five years longer than elderly males', for a given age, and single elderly females outnumber single elderly males nearly four to one. Married couples have even longer joint and last survivor life expectancies.

The average elderly homeowner has a smaller equity in their home than middle-aged homeowners. The average house value of homeowners age 65 or older is close to $35,000 with an average net equity of less than $32,000 (Curtin & Neubig, 1979). A non-repayable loan would be made available for only a fraction of the net equity.

In the table below yearly annuity payments were calculated for different life expectancies for each $10,000 of net equity. The annuity payments are shown for interest rates of three and nine percent. The far right column shows the reduced annuity payment when an interest rate differential exists. With a long life expectancy the net annuity payment becomes negative from the differential when the interest charge exceeds the gross annuity. The annuity payments shown assume that 100 percent of the net equity is borrowed. Adjustment for a loan to equity ratio of eighty percent is simply made by multiplying the payment by 0.80. A single female homeowner age 75 with a house value of $27,000 would receive $986 a year from a RAM ($r = 9\%$, $\alpha = 80\%$).

A fixed debt NRPL has the potential of protecting the elderly homeowner from inflation. A RAM can be designed similar to an open-ended mortgage on which the borrower can easily increase the value of the mortgage if the value of the house increases. The annuity payment would increase when the value of the loan increased. In fact, the fixed debt NRPL payment would increase faster than the price appreciation of the house since the homeowner would be older when the loan is refinanced. An example of how this would work follows. Assume a single elderly female with a $30,000 house with no mortgage. She contracted for a fixed debt non-repayable loan for 80 percent of her house value and with an interest rate of nine percent at age 65, when her life expectancy

TABLE 3

ANNUAL ANNUITY PAYMENTS FROM RAMs

(For Each $10,000 Net Equity)

Life Expectancy	Approximate Age[a]			Non-Repayable Loan		
	Unmarried		Married			
	Male	Female	Husband (Wife)	r = 3%	r = 9%	$r_1 = 9\%$ $r_a = 6\%$
5 years	87	92	99 (96)	$1854	$1671	$1474
10 years	74	79	86 (83)	857	658	549
15 years	65	70	77 (74)	528	340	130
20 years	57	62	69 (66)	365	195	-28

[a]Internal Revenue Code, Reg. § 1.72-9.

was close to eighteen years. She received a yearly RAM payment of $522. Now assume that over the next five years consumer prices rose at six percent per year, or 33.8 percent cumulatively, and her house value increased at the same rate. Eighty percent of the additional equity in the home could be invested in an annuity on the same terms. If the homeowners life expectancy remained at 18 years, then the annuity payment would increase by $177, or exactly the same rate as inflation. The homeowner's age, however, after five years is 70 with a corresponding lower life expectancy of 15 years. The annuity payment would actually increase by $255--an increase of 49 percent, almost fifty percent faster than the rate of inflation. An open ended non-repayable loan that could add on any additional equity from the price appreciation of the home may be a homeowner's best protection against inflation.

Empirical Estimates of the Potential Dissaving Impact from RAMs--An Analysis of the 1977 Survey of Consumer Finances

Reverse annuity mortgage payments were calculated for 278 homeowning families with heads age 65+ from the 1977 Survey of Consumer Finances (SCF). The 1977 SCF was a national survey which collected information on the economic status and financial transactions of 2563 American families.

The average potential annual RAM payment was $1,060 for all elderly homeowners in the sample. The additional

income support provided by a RAM would be an average of 18 percent of the elderly homeowners' current income. Single male homeowners would have received the highest average payment of $2,570 annually, increasing their current income by almost forty percent. Single female homeowners would have received an average annual payment of $1,210, supplementing their current income by 27 percent. Married homeowners would have received less than $800 annually, which would have amounted to an additional 10 percent above their current income. The difference in payment amounts between the groups is due primarily to their different average life expectancies.

Table 4 shows the difference between the average RAM payment possible for homeowners age 65-74 and for all homeowners age 65+. Participation in a RAM program at a younger age means the life expectancy is longer and therefore a smaller annual payment. Homeowners may want to postpone participating in a RAM program until age 70 or later in order to receive higher annual payments.

Initially a reverse annuity mortgage program will have higher average payments than when it has been available to homeowners for several years. The difference is due to the average age of the populations that consider using a RAM for the first time. The initial impact of RAMs will be a higher

TABLE 4

AVERAGE POTENTIAL RAM PAYMENTS FOR ELDERLY HOMEOWNERS: 1977

Average	All Families Head 65+	All Families Head 65-74	Single Families Head 65+	Single Males Head 65+	Married Head 65+	Poor Head 65+	Non-Poor Head 65+
Annual RAM payment	$1,060	$770	$1,210	$ 2,570	$770	$1,020	$1,060
RAM payment as proportion of annual income	18%	11%	39%	27%	10%	43%	13%
Age of head (years)	72	69	73	75	71	76	72
House Equity	$31,600	$34,200	$29,200	$38,100	$34,500	$23,300	$34,700
Number of Cases	278	189	93	23	162	36	181

SOURCE: 1977 Survey of Consumer Finances

average payment since any homeowner from age 60 to 100 is likely to participate. Older homeowners, assuming equal home equity, receive higher payments due to their shorter life expectancies. Once RAMs have been available for several years, the main enrollee is likely to be a homeowner who has recently retired and who is living on a reduced retirement income for the first time. The cross-sectional survey results, therefore, are probably a close approximation of what the initial impact of a RAM program would be.

The average annual RAM payment was nearly equal for poor[a] and non-poor families. Poor families have substantially lower equity values, but they tend to have older family heads. The most important difference is the extent to which RAM payments would supplement the families' current income.

Poor families' incomes could be increased an average of 43 percent while nonpoor families would have their current incomes increased by 13 percent.

One measurement of the importance of reverse annuity mortgages is the extent to which they could reduce the number of poor elderly families. When the RAM payment was added to the reported annual family income, the number of poor elderly homeowners was reduced by half--that is, 18 out of 36 poor elderly homeowners' incomes would have been raised above the poverty line. Since two-thirds of the elderly poor in the sample were homeowners, RAM payments would have raised over 30 percent of all the elderly poor out of poverty. These

[a]Poor families have incomes, not including in-kind income or imputed rental income, below the official poverty line.

TABLE 5

ELDERLY HOMEOWNERS AND THE EFFECTS OF RAMs

Marital Status	Percent of Elderly that Own Homes	Percent of Homeowners that are Poor	Percent of Poor Elderly Homeowners Raised out of Poverty
All elderly families	74%	17% (36 cases)	50% (18 cases)
Married	84%	12% (15 cases)	27% (4 cases)
Single Males	73%	10% (2 cases)	100% (2 cases)
Single Females	64%	30% (19 cases)	63% (12 cases)

SOURCE: 1977 Survey of Consumer Finances

estimates are based on a samll sample size, so additional research is necessary.

Cross-sectional survey results understate the importance of RAMs for two reasons. First, RAM payments as a fraction of future income is probably underestimated. Secondly, the effect of RAMs on continued homeownership among the elderly is not shown, yet this may be the most important reason to use a RAM for some homeowners who otherwise would have to relocate.

A cross-sectional survey represents a population at one moment in time, yet participation in a RAM program may be important at some later time for most homeowners. In any given single year about 14 percent of the elderly are poor. During a nine year period, twice as many of the elderly were poor for at least a one year period (Coe, 1978).

RAMs will increase the options available to homeowners, yet this important role is not displayed by cross-sectional survey results. RAMs may enable many homeowners to remain in their homes rather than having to move to a rental unit or in with family members. Homeownership among head's age 65+ is slightly lower than families with heads age 55-64 (Curtin and Neubig, 1979). RAMs may enable homeowners to remain in their homes, even if it is only for several more years.

Problems to Full Implementation of RAMs

The introduction of RAMs will need to overcome the elderly's apprehension over the use of credit and many of the elderly's isolation from participation in community programs. A recent study of non-participation in the food stamp program (Coe, 1979) found the single elderly least likely to participate primarily because they were "ill-informed" about the program. RAMs should be presented as a private means of dissolving one's own resources, rather than as a welfare program. Nevertheless, outreach efforts may be necessary to inform elderly homeowners, especially single females, about RAMs.

The NRPL, it should be made clear, is backed up 100 percent by the homeowner's house equity, so they are not going into debt, but rather they are dissaving existing wealth. This will be important since as the table below shows, when asked if they felt it was all right to borrow money to cover living expenses when income is cut or to cover expenses due to illness, the elderly, and especially retired unmarried elderly, were most likely to say no. Less than half of the elderly respondents felt it was appropriate to borrow for living expenses. One quarter of the elderly respondents did not consider medical expenses an adequate reason to borrow money.

TABLE 6

ATTITUDES OF THE ELDERLY TOWARD CREDIT

Purpose	Percent who felt it was all right to borrow to cover . . . All Respondents	All Elderly	Retired	
			Married	Unmarried
Living Expenses	49%	42%	41%	36%
Medical Expenses	85%	75%	84%	73%

SOURCE: 1977 Survey of Consumer Finances

Government transfer payments received by many of the elderly poor would be reduced with the use of a reverse annuity mortgage. Supplemental Security Income (SSI) benefits would be reduced by one dollar for each dollar received in RAM payments after the first twenty dollars each month. Total annuity payments are explicitly defined as unearned income by SSI and Food Stamps, even though the majority of the payment is dissavings and only part is interest income. Treatment of annuity payments similar to the tax system would allow the RAM participant to exclude the annuity payments from the reduction in the transfer payment until the annuity payments exceeded the investment cost of the annuity. Poor elderly homeowners under the existing SSI would likely chose to remain dependent on government transfers rather than utilizing their own resources.

Reverse annuity mortgages have the potential of supplementing elderly homeowners' incomes through an orderly dissaving of their equity in the home. The many possible variations of RAMs would allow elderly homeowners a wider range of choice than is currently available. RAMs could help many homeowners remain in their homes longer as well as protecting them partially from the effects of inflation. RAMs are fairly simple financial instruments. Estimates of the payments possible to a sample of elderly homeowners show that RAMs would contribute a significant addition to their present incomes, especially for the poor elderly.

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